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The green movement in newly industrialized countries often lags behind the West. While the green awareness has started to rise rapidly in some of these countries, the ability of attitudes to predict behaviour for environmentally sensitive products is questionable. A survey of 552 Hong Kong citizens was conducted to examine how consistent consumers' actions were with their attitudes towards seven environmentally sensitive products. The results have shown that consumers' environmental concern is not reflected in their purchasing behaviour. This calls for more education and initiative from both the government and businessmen to induce people to channel their attitudes into actions.

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Introduction

Concern about environmental degradation is on the rise in just about every corner of the world. A sharp rise in environmental awareness has been felt in all industrialized countries. Since industry has brought about many of the problems, industry must seek the solutions. Governments cannot meet the challenge alone and so the central socio-political role must be performed by the business community. Some see marketing as partly responsible for damaging the environment because the activities of marketing have increased consumption and waste through advertising incentives, product differentiation and shortening of product life cycles. A marketing approach that aims at serving the material wants of consumers through an ever increasing volume of goods without any attempt to maximize life quality draws too heavily and too quickly on already overdrawn environmental resources. People are becoming increasingly aware of the links between major environmental problems, such as water and air pollution, land degradation and chemical contamination, and everyday consumption items, such as clothing, food, housing and transport (Adams, 1990; McKusick, 1990). Marketers have begun to recognize both the need and the value of environmental or green marketing.

On the other hand the growth of eco-awareness so often cited in surveys (Dunlap and Scarce, 1991; Freeman and Dagnoli, 1990) and public willingness to make sacrifices clearly do not always find expression in action. Environmental protection has risen on the scale of values, but there is still a gap between general attitude and personal conviction (Hines *et al.*, 1986; Shrum *et al.*, 1995). Consumer response to green marketing efforts has been generally unenthusiastic and has fallen short of marketers' expectations (Goldman, 1991; Hume, 1991; Schossberg, 1991). Consumers have generally not given up their traditional brands and converted to the environmental alternative. Only a small group of people is consistent enough in its interest in the environment to allow this to express itself through actual purchasing behaviour (Grunert, 1993). This contributes to the reluctance of many companies to consider ecological manufacturing strategies if they would involve higher costs (Chase and Smith, 1992).

Newly industrialized countries

Environmental concerns will become a crucial part in Asia's business scene, as it has been the case in the West. Green marketing has just surfaced in recent years in Asia's newly industrialized countries. The World Health Organisation estimates that by the turn of the century, 18 per cent of the expenditure in Asia's newly industrialized countries will go towards environment-related expenses (Levin, 1991). The rapid growth of industrial/commercial activities remains the root of pollution in these countries. For example, between 1970 and 1995, Hong Kong's waste disposal rose by 500 per cent while the population was increased by only 50 per cent. Hong Kong has been experiencing a green era in the last few years as environmentalism has swept across the world, making the public more informed about environmental problems and the urgency for solution (Chan, 1993; Ng, 1991; Unquiola, 1991).

Compared with what has been happening in the West, the people of Hong Kong are just at the stage of green awakening. Nevertheless, the growth of the green consciousness picked up momentum when the government began to take initiatives and played an active role in socializing environmentalism. More and more companies are involved in turning the region's growing environmental awareness into an expanded business opportunity rather than an obstacle (Barrett, 1990; *Hong Kong's Environmental Challenge*, 1991). More and more consumers have started to assess the environmental impact of product/service choices and to change their behaviour in purchasing, consuming and dispensing of the product (Ting, 1991).

It seems that almost every month another green survey is published. These reports usually start with stating the latest opinion polls on consumers' increasing environmental concern and willingness to change their

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consumption habits. According to a survey of 5,744 residents (ECCO, 1996) 58.5 per cent of the respondents claimed that they shopped for environmentally safe products, compared with 55.7 per cent in 1993. However, only 46.5 per cent would pay more for green products now as against 55.4 per cent two years ago. This was probably due to the downturn in the economy in the past two years.

A variety of green products are now offered to consumers in North America and Europe, but this is not the case in most Asian countries. While many consumers claim that they would buy green products the availability of such products is scarce in Hong Kong. Some studies reported that Hong Kong people were found to be one of the most passive and reluctant groups on environmental protection issues (Yip, 1993). It is therefore doubtful that what the consumers claim in the surveys is true.

Research objectives

The specific objective of the study is to assess both Hong Kong consumers' level of environmental awareness and their preparedness to act upon this awareness. We aim to find an answer to the question "Do consumers' purchasing activities equally match and reflect their perceptions of the detrimental impact of products on the environment?"

Researchers have been repeatedly disappointed by the inability of measured environmental knowledge and attitudes to explain environmentally responsible behaviours (Chan and Yam, 1995; Schahn and Holzer, 1990; Verhallen and Van Raaij, 1981). The ordinary consumer may be highly concerned for ecology, whether they will act consistently is another matter. It is believed that a high level of environmental concern does not necessarily lead to the same level of purchase action for a variety of reasons, for instance unavailability of green alternatives, inconvenience and higher price, etc.

Methodology

The data reported in this paper were collected as part of a larger study designed to test the relationship between attitudinal and behavioural variables that were related to environmental issues. The survey approach was adopted. In order to meet the objectives of this project, the survey instrument had to provide measurements of the level of concern towards certain environmentally sensitive products and the purchase behaviour in relation to these products. We assumed that knowledge of the harmful effect of a product's use on the environment might have an impact on whether or not that product was purchased and used.

Seven product classes were chosen because of their relevance to the environment:

1 wood;
2 pesticides;
3 plastic, including packaging;
4 glass, including bottles;
5 aerosols;
6 paper products; and
7 household cleaning agents.

In the development of a scale for the measurement of product-specific environmental concern, it was decided to employ a scale using self-perception/evaluation of the impact of the product on the environment. This self-perception/evaluation was a combination of both the cognitive and the affective elements. The perception was measured along a five-point Likert scale, 1 meant very little detrimental effect on the environment and 5 meant very large detrimental effect. As for the measurement of purchase behaviour, it was realized that many consumers had little or no experience in purchasing the substituting green products for some product classes simply due to their unavailability in Hong Kong. One appropriate proxy of actual behaviour might be the intention to act (Hines *et al.*, 1986). In this survey, based on the approach used by Polonsky and Suchard (1990), the respondent was asked to rate his/her level of consideration of the product's detrimental effect prior to purchase. Respondents might consider buying the "greener" version of the product or they might consider consuming less of the product where there were few alternatives. This is the mildest form of environmental-friendly behaviour. People may not have actually done anything but at least they have thought about changing their behaviour. Again, the five-point Likert scale was used with 1 meaning very little pre-purchase consideration and 5 meaning very much pre-purchase consideration.

To examine whether an individual was consistent, each rating of detrimental impact was compared to the rating of pre-purchase consideration. If consumers ranked the product the same for both impact and pre-purchase consideration, their perceptions would exactly match their actions on environmental aspects, otherwise they were not consistent.

The survey was conducted via personal interviews at major shopping centres of Hong Kong where people from all walks of life were likely to pass by. The systematic sampling method was employed and the survey period covered the opening hours of those centres

across one whole week. Consequently, a total of 552 respondents were successfully interviewed. The sample profile was comparable with the demographic profile of the Hong Kong population.

Data analysis and major findings

I. Environmental evaluation and purchase intention

Table I shows the mean values of the concern scale (evaluation) and the purchase-intention scale (pre-purchase consideration). Of the range of products investigated, plastics (evaluation = 4.23) and pesticides (evaluation = 4.03) were perceived to have a high detrimental effect to the environment. In contrast, glass and paper were not considered to have much of a detrimental effect. The number of respondents who considered the product very harmful to the environment (Table II) was the highest for plastics (318), the second highest for pesticides (267).

The average ratings of all respondents on the level of consideration they gave to the environmental impact of the seven product classes prior to purchase were quite low (Table I). All mean values were smaller than three, the middle point, and each value was smaller than the respective evaluation rating. Among the group of respondents who rated the products as environmentally unfriendly (Table II), only some consideration would be given to the environmental safety of aerosols (mean rating = 3.22) and plastics (mean rating = 3.05) prior to their purchase.

II. Relationship between perception and action

A preliminary inspection of the descriptive statistics, as laid out in Table I and Table II, would indicate that respondents had lower level of pre-purchase consideration to the product than the rating of its detrimental effect on the environment. A paired *t*-test provided a check of these results. The distribution of evaluation values was significantly higher than the distribution of consideration values for all the product classes examined. Even though correlation analysis (Table III) showed that the two sets of values were

Table I
Evaluation of environmental impact and its effect on purchase decisions

	Mean ratings (N = 548)	
Product class	**Evaluation***	**Pre-purchase** consideration**
Wood	3.34	1.91
Pesticides	4.03	2.55
Plastics including packaging	4.28	2.76
Glass including bottles	2.49	1.77
Aerosols	3.88	2.78
Paper products	2.99	2.09
Household cleaning agents	3.18	2.24

Notes:
* 1 means little harm to the environment whereas 5 means great harm
** 1 means little pre-purchase consideration whereas 5 means very much

Table II
Effect of the product's environmental impacts on purchase decisions among respondents who perceived the product as very harmful to the environment

		Pre-purchase consideration*	
Product class	**No. of Respondents thought it harmful (evaluation = 5)**	**Mean**	**Median**
Wood	183	2.21	2
Pesticides	267	2.86	3
Plastics including packaging	318	3.05	3
Glass including bottles	50	2.18	1
Aerosols	228	3.22	3
Paper products	116	2.87	3
Household cleaning agents	107	2.91	3

Note:
* 1 means little consideration whereas 5 means very much

Table III
Relationships between evaluations of products' environmental impacts (E), and pre-purchase considerations (C)

Product class	Correlation coefficient*	Paired *t*-test (*t* value) All cases**	E≥3***
Wood	0.2346	19.51	19.65 (N = 388)
Pesticides	0.2647	21.62	24.30 (N = 483)
Plastics including packaging	0.2625	22.72	25.45 (N = 506)
Glass including bottles	0.2570	11.94	18.98 (N = 260)
Aerosols	0.2989	15.77	20.13 (N = 461)
Paper products	0.3920	14.01	19.47 (N = 335)
Household cleaning agents	0.3254	14.97	19.40 (N = 390)

Notes:
* All are significant, $p < 0.001$, $N = 548$
** All *t* values are significant, $p < 0.001$, $N = 548$
*** All *t* values are significant, $p < 0.001$

related, they were probably not at the same level. This was true for all respondents as well as for those who considered the products harmful to the environment (i.e. who gave an evaluation rating of three or more).

To further examine the consistency of consumers' perception and action, each respondent's rating of detrimental impact was compared to his/her pre-purchase consideration. If they ranked the product class the same for both impact and consideration, their evaluation perceptions would exactly match their actions. Table IV shows the results. A generalisation which can be made from the table is that purchase activities usually do not follow evaluations/perceptions. The percentages of respondents that fell into the group E>C were over 50 per cent for all product classes.

III. Pre-purchase considerations and actual purchase behaviour

In order to test the hypothesis that pre-purchase consideration was a good indicator of actual purchase behaviour, an examination of their relationship using correlation analysis was carried out. Within the same questionnaire, ten actual commitment statements were set on a five-point Likert scale where 1 meant least agree and 5 meant most agree. Among them three statements were directly related to purchase behaviour:

1 I bought a product because it had a lower polluting effect.
2 I stopped using products which are detrimental to the environment.
3 I take into account the amount of packaging on goods when I buy.

Resulting correlation coefficients are reported in Table V. It is evident from the results of this analysis that some relationships exist between pre-purchase consideration and actual purchase behaviour.

IV. Categorization of respondents by their environmental evaluation and pre-purchase consideration responses

The ratios of each product's evaluation score and consideration score were used as an input for the hierarchical cluster analysis.

Table IV
Consistency of respondents in terms of evaluation (E) and pre-purchase consideration (C)

Product class	E<C (%)	E=C (consistent) (%)	E>C (%)
Wood	7.3	27.0	65.7
Pesticides	6.9	23.0	69.1
Plastics including packaging	4.9	26.1	69.0
Glass including bottles	11.7	37.1	51.2
Aerosols	9.7	31.8	58.5
Paper products	9.5	35.2	55.3
Household cleaning agents	9.8	34.1	56.1

Note:
$N = 548$

Table V
Correlations between pre-purchase considerations and general purchase behaviour

	Wood	Pesticides	Plastics	Glass	Aerosols	Paper	Cleaners
Overall	0.2001	0.2733	0.3334	0.2055	0.3111	0.1950	0.2362
Beh 1	0.1227	0.1820	0.2368	0.1229	0.2221	0.1271	0.1672
Beh 2	0.1362	0.2158	0.2283	0.1482	0.2467	0.0811*	0.1270
Beh 3	0.1603	0.1880	0.2286	0.1599	0.1974	0.1712	0.1740

Notes:
$N = 540$
Beh1 – I bought a product because it had a lower polluting effect
Beh2 – I stopped using products which are detrimental to environment
Beh3 – I take into account the amount of packaging on goods when I buy
Overall – the average of the scores to the above three behaviour statements
All are significant at 0.001 level except for * where $p = 0.059$

The techniques proceed by linking together respondents with similar responses to the seven product classes, using error sum of squares criteria. Two clusters were generated. Table VI shows mean ratios for the seven product classes of each cluster. Respondents in cluster one had relatively more consistent responses to their evaluation scores and pre-purchase considerations scores, i.e. the ratios were all very close to one. An examination of the statistics further showed that this group was consistently friendly to the environment (i.e. both E and C scores were high). Respondents in cluster two ranked the products more for environmental impacts than for pre-purchase considerations. In other words, their actions did not follow their perceptions.

To examine whether there was any significant difference between the two clusters in terms of their demographic/socio-economic characteristics, the chi square test was performed. The variables included age, sex, marital status, education, occupation, family size and family income. Among all these variables, only sex and occupation were found to be significantly associated with cluster membership at the five per cent level. Females were more consistent than males. Students and housewives were more consistent than others.

Interpretation of results

The seven product classes received different evaluation ratings. The use of paper and glass were not considered to be very harmful to the environment probably because of the indirect effects involved. It will not lead to air pollution or noise pollution which are the major concerns of most Hong Kong people. In contrast, plastics (including packaging) and pesticides were perceived to have large detrimental effects because the effects were more direct. The Hong Kong government has trouble with plastic bag disposal and "use your own shopping bag" or "reduce the use of plastic bags" have always been popular slogans in every environmental campaign. Again, pesticides are harmful to human health and are of immediate concern to most people.

The only eco-friendly purchase behaviour was related to aerosols and plastics. A possible explanation may be that more alternatives are available for these two types of products in comparison with the other products except paper. Recycled paper is not uncommon in the market place but, in our study, respondents did not give much consideration to buying this "greener" alternative of paper product. Therefore in the case of paper products, it is not the lack of alternatives that

Table VI
Cluster analysis based on environmental evaluation and pre-purchse consideration

	Mean evaluation/consideration ratio							No. of Cases
Cluster	**Wood**	**Pesticides**	**Plastics**	**Glass**	**Aerosols**	**Paper**	**Cleaners**	**(%)**
1	1.54	1.28	1.31	1.18	1.18	1.25	1.15	223 (44%)
2	2.88	2.88	2.82	2.17	2.51	2.24	2.40	284 (56%)
Total	2.29	2.18	2.15	1.73	1.92	1.81	1.86	507 (100%)

lead to low level of consideration. It is the seriousness of the problem that affects the behaviour. People just do not feel that using paper will bring a lot of harm to the environment. Moreover recycled paper is more expensive than ordinary paper.

Conclusion

The results of this study have shown that Hong Kong consumers' environmental concern, though present, is not reflected in their purchase behaviour. No strong relationship exists between self-perception of the environmental impact of the seven product classes and purchase behaviour of these products in terms of pre-purchase consideration. There seems to be at least two reasons for this. One may be related to the almost classical problem of a lack of high correlations between attitudes and behaviour, a trivial but common finding (Dispoto, 1977; Maloney and Ward, 1973; Van Houweligen and Van Raaij, 1989; Weigel and Weigel, 1978). Another may be that consumers in Hong Kong do not perceive the purchasing behaviour of an individual as one potential opportunity to improve environmental conditions. Moreover, the actual market situation in terms of price, availability and distribution does not really favour green purchase behaviour.

To conclude, the prediction of a responsible environmental purchase behaviour is not a simple process. Being aware of the environmental consequences of actions alone may not cause people to display more favourable environmental behaviours. The discrepancy between attitudes and behaviours is explained, in large part, by the well-known economic axiom – consumers are motivated by self-interest. The conversion of personal responsibility into action is slowed down or prevented by non-environmental motives, such as comfort, pleasure or the lower performance standards of the product. An important implication is that marketing strategies based on the assumption that consumers are deeply concerned about environmental issues and are acting accordingly may not be effective. Be that as it may, recent research does indicate a consistent trend towards greater environmental awareness and a corresponding adaptation of customer buying habits (Alwitt and Berger, 1993; Schwepker and Cornwell, 1991). While consumer confusion and lack of commitment may lead some companies to avoid strategies that are positioned as "eco-friendly", all companies need to develop the capability of collecting and interpreting environmental information. There is a degree of consumer uncertainty because of the extreme complexity of ecological data. Above and beyond the activities of various environmental and consumer organizations, the marketer has a responsibility to inform and advise.

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